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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/534,690 | 10/12/2005 | Yoshiyuki Ochi | DK-US055091 | 5600 |
| 22919 | 7590 | 02/07/2008 | EXAMINER | |
| GLOBAL IP COUNSELORS, LLP 1233 20TH STREET, NW, SUITE 700 WASHINGTON, DC 20036-2680 | | | | KASTURE, DNYANESH G |
| ART UNIT | | PAPER NUMBER | | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/534,690 | OCHI ET AL. | |
| | Examiner | Art Unit | |
| | DNYANESH KASTURE | 4147 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 17 November 2003.
 2a) This action is **FINAL**. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-10 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) Claim(s) _____ is/are allowed.
 6) Claim(s) 1-6, 9 and 10 is/are rejected.
 7) Claim(s) 7 and 8 is/are objected to.
 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on 17 November 2003 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ . |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>13 May 05</u> . | 6) <input type="checkbox"/> Other: _____ . |

DETAILED ACTION***Specification***

1. The disclosure is objected to because of the following informalities: Page 13, Lines 7-9 presently reads: "The correction of P-Q characteristic is carried out only in a case that the DC voltage is supposed to become the ideal DC voltage value of the AC power voltage (AC voltage x 2^{1/2})".
2. It is not clear why a "correction" in the P-Q characteristic is done under "ideal" conditions. The dictionary definition of the word ideal is:- best, perfect. If a condition best/perfect, no corrections should be necessary. In addition, the "ideal DC voltage value" is defined as "AC voltage x 2^{1/2}". This is a universally true for all values of AC voltage, the Peak value is always = AC voltage x 2^{1/2}, assuming that the RMS value of the AC voltage is being stated.
3. It is suggested that the sentence should read: "The correction of P-Q characteristic is carried out only in a case when the AC Voltage is judged to be stable AND the stable value of input AC voltage is significantly different (higher or lower) from the AC voltage value corresponding to the current P-Q characteristic being used by the controller AND the DC voltage sensed at the output of the converter is the expected converter output of the AC voltage (no regeneration)."
4. Page 4, lines 25-26: "..maintains a power voltage value instead the maintaining of the discharge pressure.." needs to be checked for syntax error. The following is suggested :"..maintains a power voltage value instead of maintaining the discharge pressure.."

Appropriate correction is required.

Claim Objections

5. Claim 7 is objected to because of the following informalities: the phrase "plurality of power voltage" should be "plurality of power voltages". Appropriate correction is required.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1-5, 9 and 10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

8. In Re claim 1, the phrase "driving a pump using the motor to change the discharge pressure – discharge flow characteristic in correspondence with a power voltage". This phrase suggests an inherent ability of the motor to change the pressure/flow characteristics with power voltage. The primary function of the motor is to drive the pump. It is not clear how the MOTOR changes the P-Q characteristics as a function of the power voltage. The original claim language suggests that "change the discharge pressure – discharge flow characteristic in correspondence with a power voltage" is a claim limitation that stands alone and should be a separate method step. Further, it is suggested that the term "power voltage" be clarified using an alternate phrase such as "detected power source voltage".

9. For the purpose of prior art rejection in a later section, the claim will be examined as interpreted above.

10. In Re claim 4, with reference to the phrase: "changing the discharge pressure – discharge flow characteristic for the DC voltage upon judging that the DC voltage is the ideal DC voltage value of the alternate current power voltage", it is unclear why a change in the PQ characteristic would be made when the conditions are ideal. The dictionary definition of ideal is best/perfect. Normal interpretation of best/perfect conditions would be that no changes are necessary.

11. By the same reasoning, with reference to the phrase "maintaining a changed discharge pressure – discharge flow characteristic upon judging that the DC voltage is not the ideal DC voltage value of the alternating current power voltage", it is unclear why a condition is maintained under less than ideal conditions. Also the phrase "just previously" needs to be clarified.

12. For the purpose of prior art rejection in a later section, it will be assumed that the applicant intended to make changes to the control algorithm if necessitated by changes in power voltage, and making changes only when the system is stable.

13. In Re claim 5, the word "maintaining" could be interpreted as "keeping constant". Keeping the power voltage constant by regulating means would make the last two steps in claim 4 unnecessary. A better description is needed to understand what is being claimed.

14. In Re claim 9, with reference to the phrase “judgment means for judging whether or not a DC voltage of an inverter for supplying a driving voltage to a motor is an ideal DC voltage value of an alternate current power voltage”, the “ideal DC voltage value” is defined as “AC voltage x $2^{1/2}$ ”. This is a universally true for all values of AC voltage and no “judgment” is necessary, the Peak value is always = AC voltage x $2^{1/2}$, assuming that the RMS value of the AC voltage is being stated. In addition, applicant should confirm or deny invoking 112, 6th paragraph by using the phrase “means for judging whether ..”.

15. With reference to the phrase “changing a discharge pressure – discharge flow characteristic for the DC voltage when it is judged that the DC voltage is the ideal DC voltage value of the alternate current power voltage”, it is unclear why a change in the PQ characteristic would be made when the conditions are ideal. The dictionary definition of ideal is best/perfect. Normal interpretation of best/perfect conditions would be that no changes are necessary.

16. By the same reasoning, with reference to the phrase “maintaining the changed discharge pressure – discharge flow characteristic upon judging that the DC voltage is not the ideal DC voltage value of the alternating current power voltage”, it is unclear why a condition is maintained under less than ideal conditions. Also the phrase “just previously” needs to be clarified.

17. For the purpose of prior art rejection in a later section, it will be assumed that the applicant intended to claim an apparatus that is capable of making changes to the control algorithm if necessary, only when the system is stable.

18. Claims 2 and 3 are indefinite as being dependant on claim 1.

19. Claim 10 is indefinite as being dependant on claim 9.

Claim Rejections - 35 USC § 102

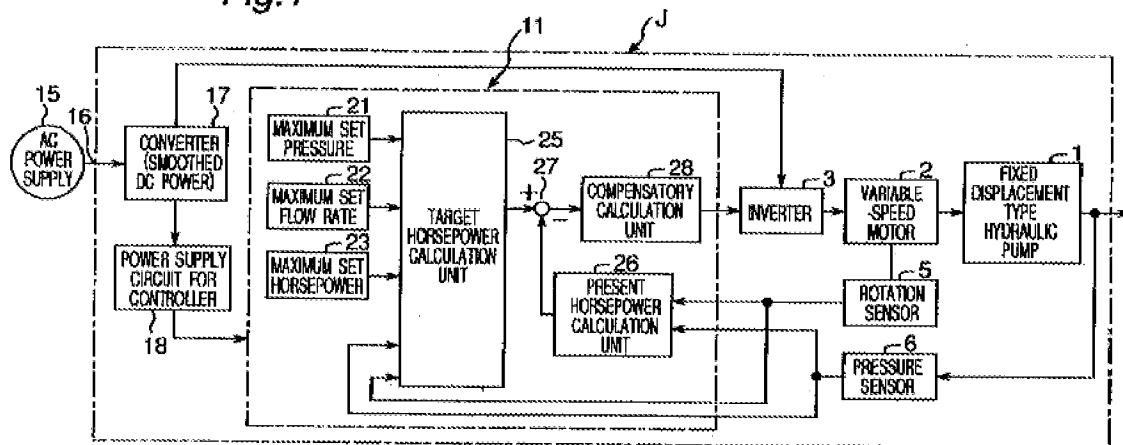
20. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

21. Claim 1, 6 and 9, as far as they are definite, are rejected under 35 U.S.C. 102(b) as being anticipated by Horiuchi et al (PCT Publication WO01/21959).

Fig. 1



22. In Re claim 1, with reference to Figure 1 depicted above, Horiuchi et al discloses a pump driving method comprising:

- driving a motor (2) using a controller (11) based on a horsepower command value using a discharge pressure – discharge flow characteristic (as described on Page 4, Paragraph [0021])
- carrying out feedback control of the discharge pressure using the signal from the pressure sensor (6) (as described in line 3, Page 4, Paragraph [0021])
- driving a pump (1) using motor (2) (as described in line 14, Page 4, Paragraph [0021])
- the pump (1) inherently changes its pressure/flow rate when the AC power source voltage drops due to the lowering of the input horsepower as a result of the drop in power voltage. This condition is temporary until the controller judges which region the present operating state belongs to and acts accordingly to stabilize the pump. If the voltage drop is significant, the controller may not be able to stabilize the pump since the source input horsepower is insufficient to maintain the new state.

23. In Re claim 6, with reference to Figure 1 depicted above, Horiuchi et al discloses a pump driving apparatus comprising:

- a motor (2) configured to be driven based on a command signal from the inverter (3) using a discharge pressure - discharge flow characteristic (Page 3, Paragraph [0019], line 9)
- to feedback control (27) a discharge pressure (6)

- a pump (1) operatively coupled to motor (2)
- a characteristic changing section (21), (22) where the maximum pressure and flow rate can be changed. Also, the microcomputer element of the characteristic changing section is inherently capable of calculating a new pressure - flow rate characteristic as a programmed function of power voltage input value.

24. In Re claim 9, with reference to Figure 1 depicted above, Horiuchi et al discloses :

- a motor (2) configured to be driven based on a command signal from the inverter (3) using a discharge pressure - discharge flow characteristic (Page 3, Paragraph [0019], line 9) to feedback control (27) a discharge pressure (6)
- a pump (1) operatively coupled to the motor (2)
- an apparatus (11), (21), (22), (23), (25), (27), (28) that is capable of making changes to the control algorithm if necessary, only when the system is stable.

Claim Rejections - 35 USC § 103

25. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

26. Claim 4, as far as it is definite, is rejected under 35 U.S.C. 103(a) as being unpatentable over Horiuchi et al (PCT Publication WO01/21959) and in view of Bhagwat et al (US Patent 4,893,067 A).

27. In Re claim 4, Horiuchi et al discloses a pump driving method comprising:

- driving a motor (2) using a controller (11) based on a horsepower command value using a discharge pressure – discharge flow characteristic (as described on Page 4, Paragraph [0021])
- carrying out feedback control of the discharge pressure using the signal from the pressure sensor (6) (as described in line 3, Page 4, Paragraph [0021])
- driving a pump (1) using motor (2) (as described in line 14, Page 4, Paragraph [0021])

28. However Horiuchi et al disclose how to make changes to the control algorithm if necessitated by changes in power voltage, and making changes only when the system is stable.

29. Nevertheless, Bhagwat et al discloses in the abstract: "The motor speed control circuit produces a family of torque-speed curves which maintain speed constant". It is well known in the art that torque - speed curves of a motor have

equivalent pressure – flow rate curves for pumps operatively driven by the motor.

When conducting a reduced voltage control operation for soft starting squirrel cage induction motors, appropriate torque - speed curves are used corresponding to each step increase in the voltage to control and stabilize operation each step of the way from startup to full power pump operation.

Therefore Bhagwat et al inherently teaches how to maintain stability when torque - speed curves change as a function of changes in power source voltage.

30. It would have been obvious to a person having ordinary skill in the art at the time of the invention to modify the pump driving method of Horiuchi et al to incorporate the step of maintaining stability as inherently taught by Bhagwat et al discussed above, for the purpose of permitting operation from low power source voltages as stated in Bhagwat et al in Column 1, Line 62).

Allowable Subject Matter

31. Claims 7 and 8 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

32. Claims 2, 3, 5 and 10 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Conclusion

33. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Seima et al (US Patent 6,873,125 B2) discloses another motor driving method and apparatus.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DNYANESH KASTURE whose telephone number is (571)270-3928. The examiner can normally be reached on Mon-Fri, 9:00 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, George Nguyen can be reached on (571) 272-4491. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Dnyanesh Kasture
Examiner
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